

April 17, 1934.

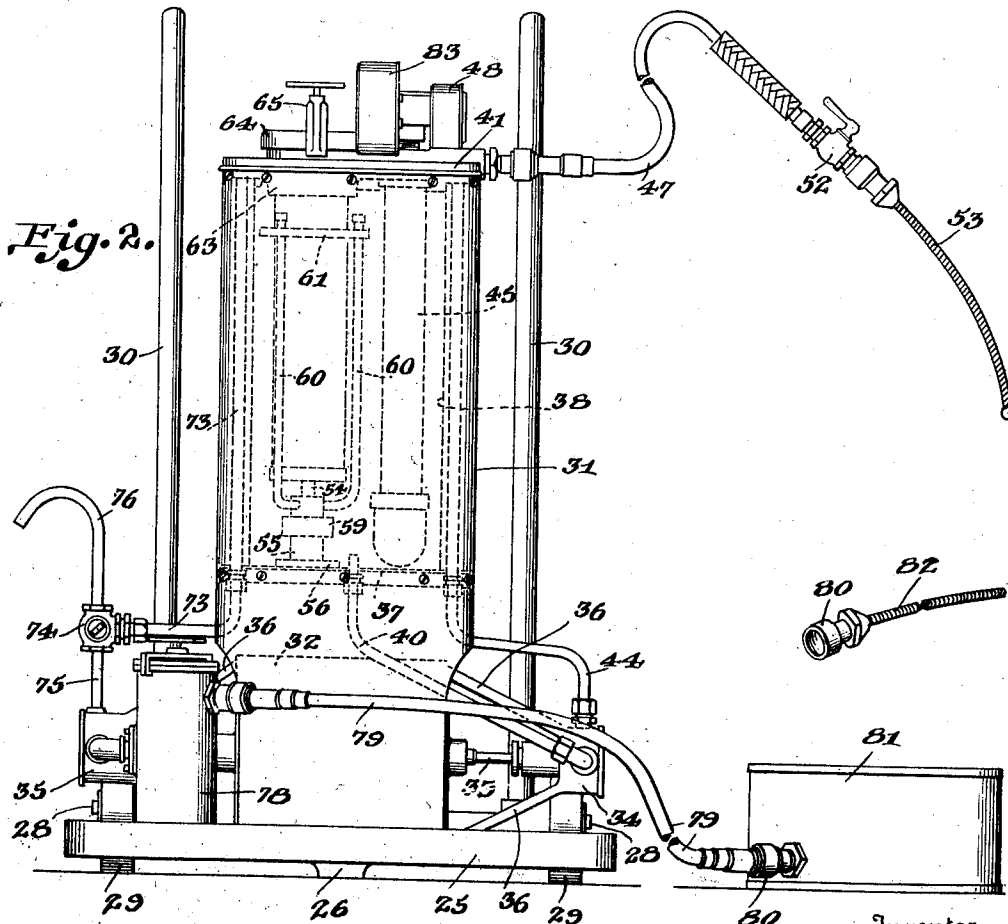
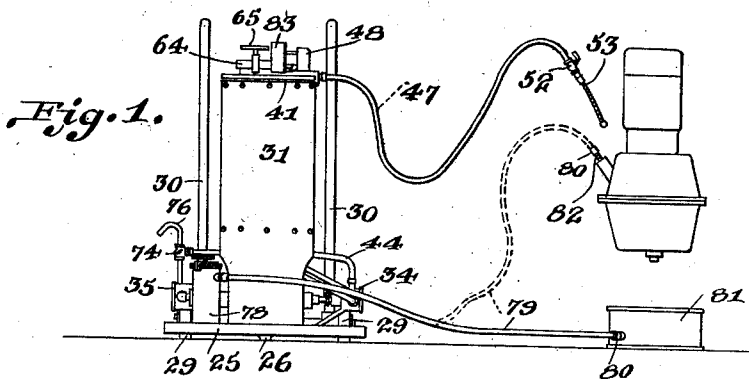
S. L. MENGE

1,955,199

PUMP APPARATUS

Filed Sept. 28, 1933

6 Sheets-Sheet 1



Inventor
Stanley L. Menge

By Wilkinson & Mawhinney
Attorneys

April 17, 1934.

S. L. MENGE

1,955,199

PUMP APPARATUS

Filed Sept. 28, 1933

6 Sheets-Sheet 2

Fig. 3.

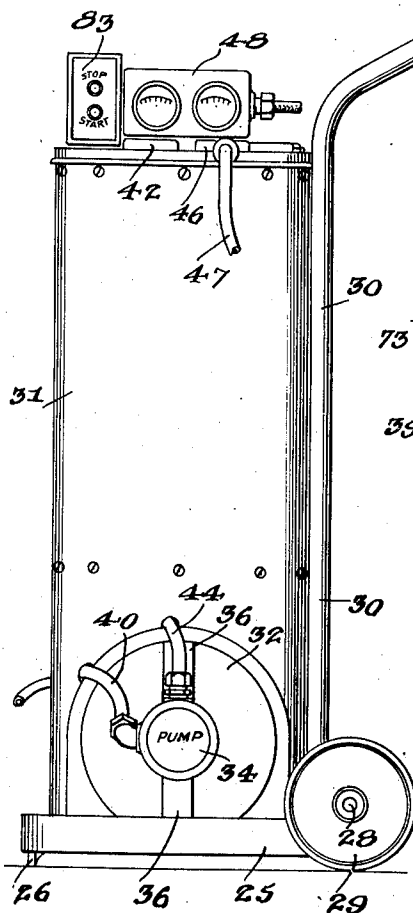
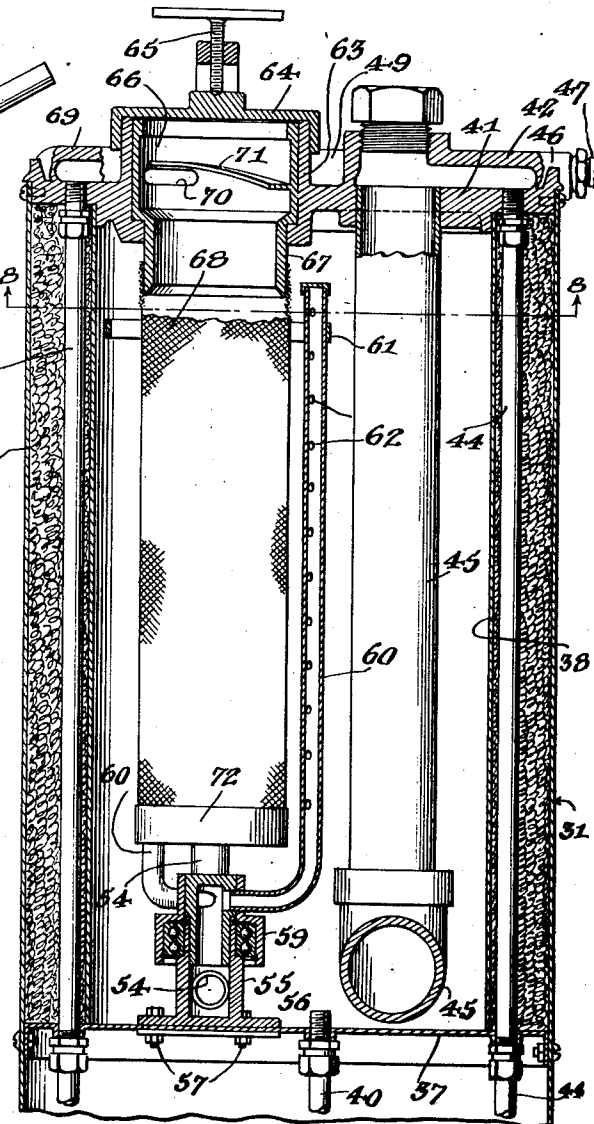


Fig. 4.



Inventor
Sidney L. Menge

By *Wilkinson Mawhinney*
Attorneys

April 17, 1934.

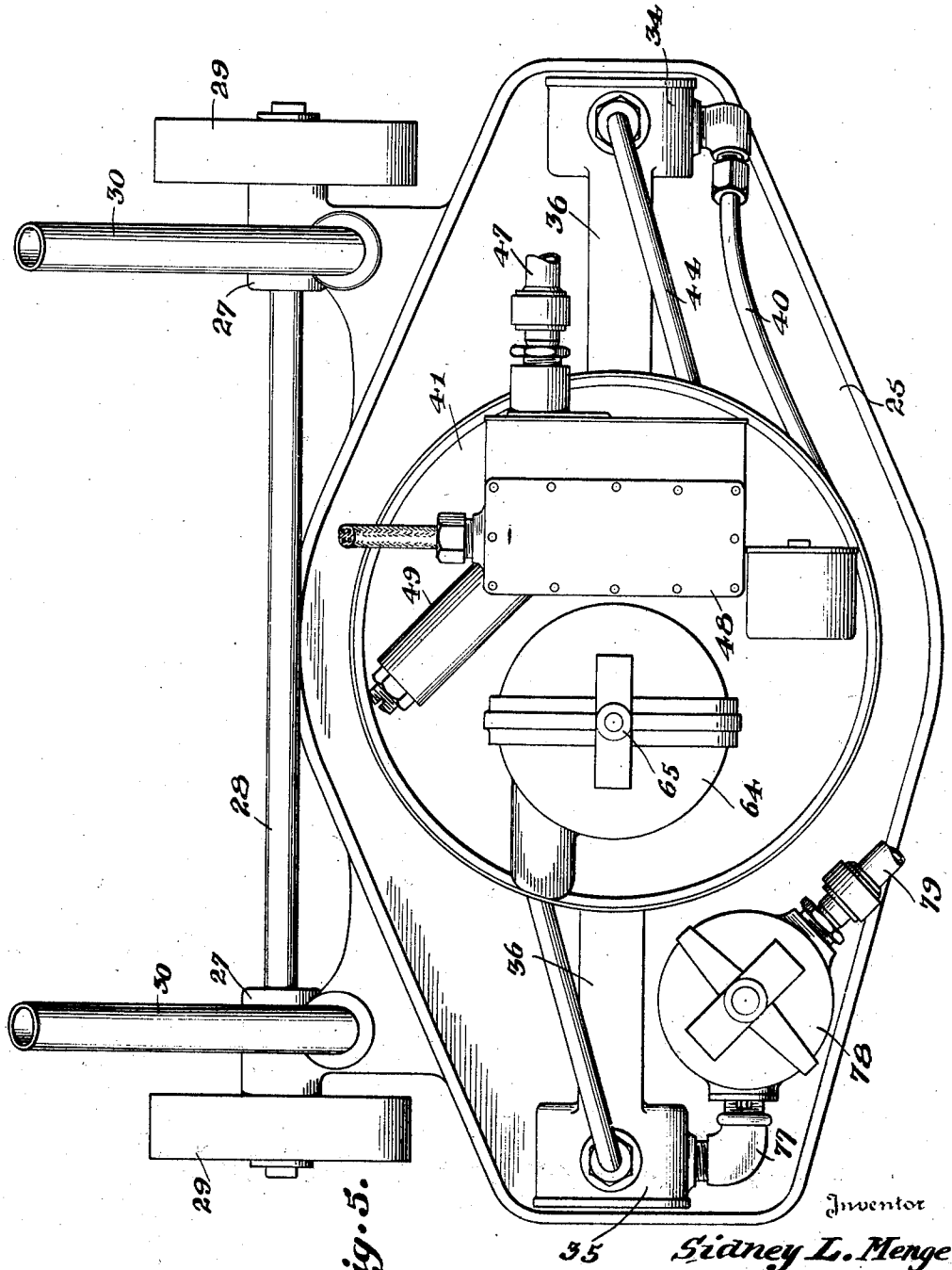
S. L. MENGE

1,955,199

PUMP APPARATUS

Filed Sept. 28, 1933

6 Sheets-Sheet 3



By Wilkinson & Mawhinney
Attorneys

S. L. MENGE

PUMP APPARATUS

6 Sheets-Sheet 4

[illegible]

Sidney L. Menge

By Wilkinson Mawhinney
Attorneys

April 17, 1934.

S. L. MENGE

1,955,199

PUMP APPARATUS

Filed Sept. 28, 1933

6 Sheets-Sheet 5

Fig. 8.

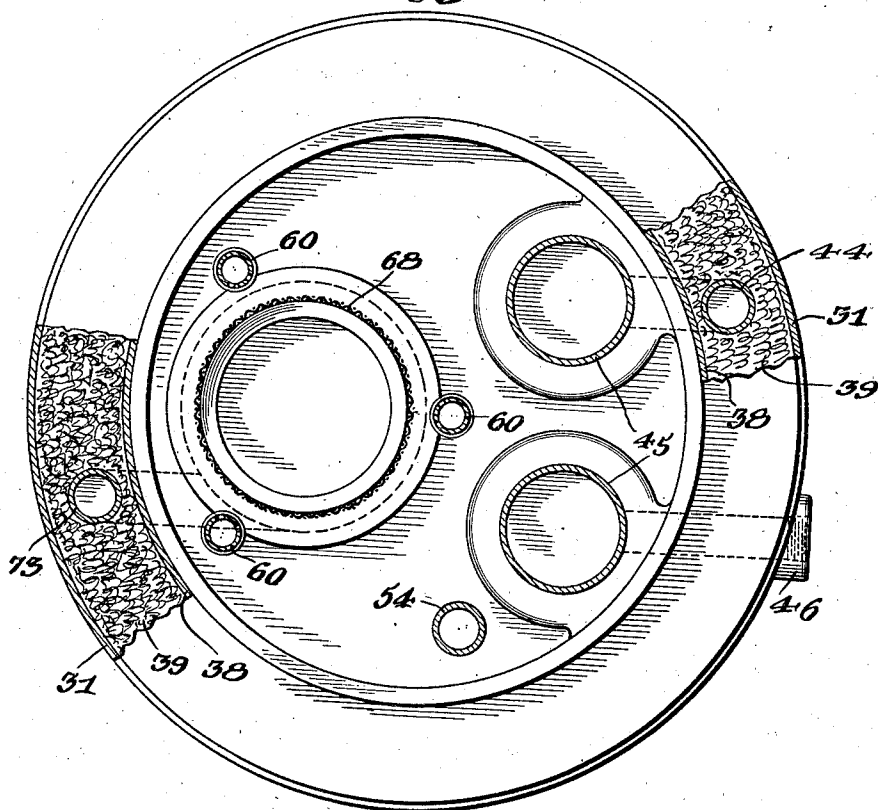
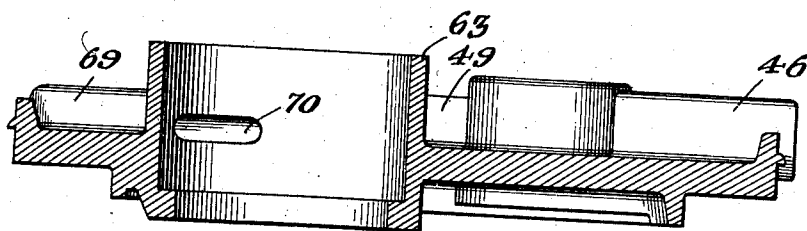


Fig. 9.



Inventor

Sidney L. Menge

By Wilkinson & Mawhinney
Attorneys

April 17, 1934.

S. L. MENGE

1,955,199

PUMP APPARATUS

Filed Sept. 28, 1933

6 Sheets-Sheet 6

Fig. 10.

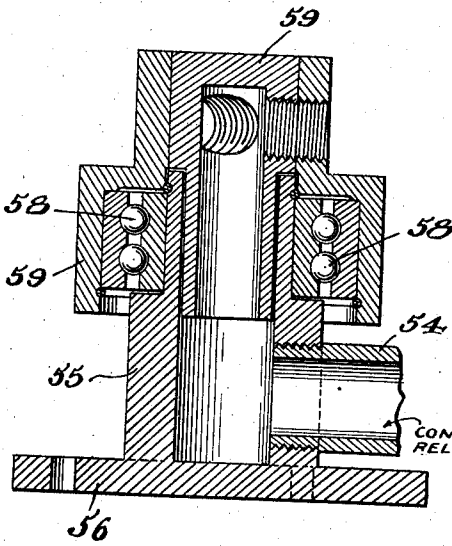


Fig. 11.

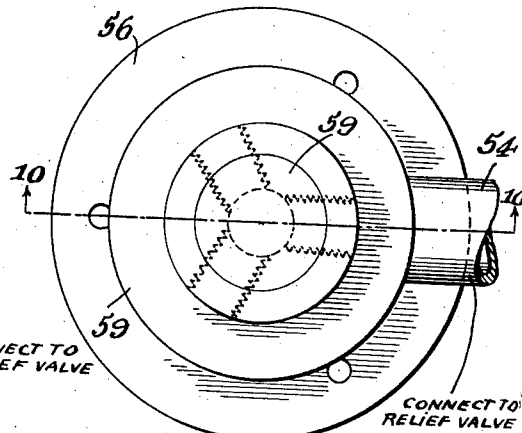
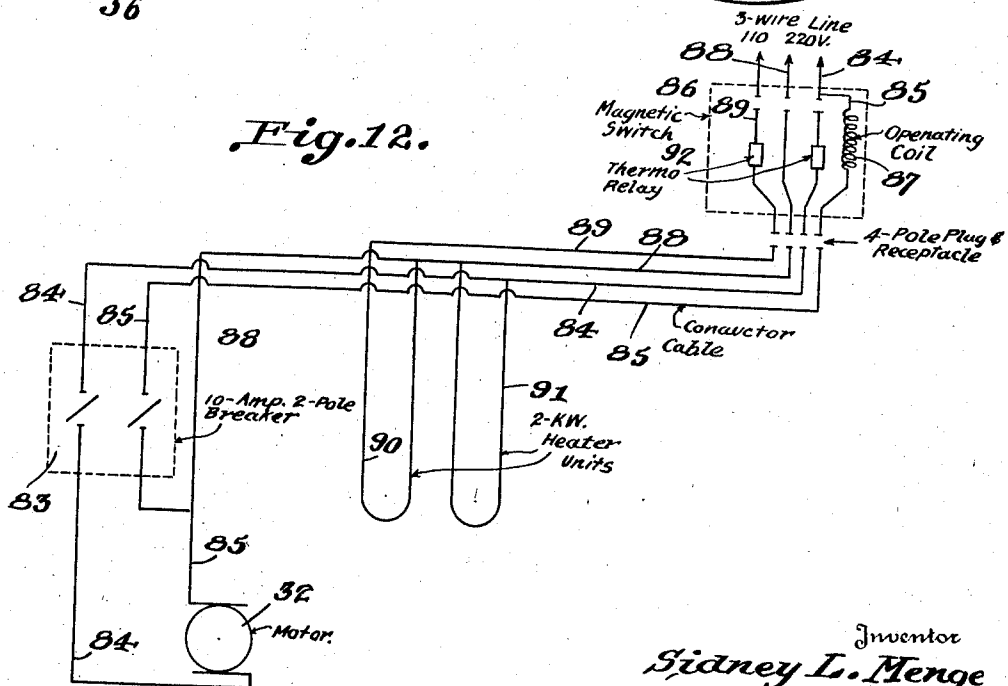


Fig. 12.



Inventor
Sidney L. Menge

By *Wilkinson Mawhinney*
Attorneys

UNITED STATES PATENT OFFICE

1,955,199

PUMP APPARATUS

Sidney Laurence Menge, New Orleans, La.

Application September 28, 1933, Serial No. 691,403

13 Claims. (Cl. 184—1.5)

The present invention relates to a pump apparatus and more particularly to certain improvements in the inventions disclosed in my pump apparatus Patents Nos. 1,497,575, granted June 10, 1924 and 1,552,998, granted September 8, 1925.

An object of the present invention is to provide a simplified and condensed structure which may be adapted for various uses but more particularly for removing lubricants from containers, such as tanks, barrels, cans, gear cases, transmission cases, differentials, clutch cases and all other types of enclosures, and wherein the apparatus is adapted to circulate a cleaning or flushing liquid through the enclosures in a desired heated state so as to insure not only the removal of the lubricant or other liquids but also the thorough cleansing of the enclosure.

Another object of the invention is to provide a relatively light simply constructed portable pump apparatus of the above outlined character which may be operated by an electric motor and an electric heater and which is capable of control by a relatively simple and efficient electric circuit embodying a single throw two pole switch and an automatic magnetic switch governed by the single throw switch arranged in circuit with the motor and the one or more heaters, thus placing the entire equipment under the control of the single throw switch.

Another feature of the present invention is to provide a construction wherein all of the fluid containing parts, heaters and the like may be enclosed within a heat insulated casing or container so that the apparatus may be used with increased efficiency over the prior structures for inside or outside work.

Another feature of the present invention is to provide a pressure relief valve constructed, mounted and disposed in a novel and peculiar manner so that when the pump is not discharging a fluid, the fluid may be utilized for cleansing strainers and the like used in the system.

Another feature of the present invention is to provide a motor with a shaft to which is directly keyed the impellers of the pumps used with the consequent advantages of compactness of the structure and elimination of shafting, flexible couplings, and other connections heretofore used in the art.

The invention also aims at the provision of a structure embodying the above features and which eliminates complicated piping, and with which temperature and pressure indicators and gauges of conventional form may be used for con-

trolling the heating elements and the pressure of the liquid in the discharge duct or pipe of the apparatus.

The invention also has as an advantage the structural feature of accommodating the gauges or indicators in such manner that the liquid to be circulated through the apparatus may be introduced into the apparatus through the openings at which the indicators or gauges are connected.

With the foregoing and other objects in view, the invention will be more fully described hereinafter and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views,

Figure 1 is a side elevation of a pump apparatus constructed according to the present invention and shown as applied to the crank case of an internal combustion engine.

Figure 2 is a similar view on an enlarged scale, the dotted lines showing the relative locations of the container, the heaters and the spraying device for the main screen.

Figure 3 is a one end elevation of the same.

Figure 4 is an enlarged fragmentary vertical section taken through the upper portion of the device showing the container and the various parts mounted therein.

Figure 5 is a top plan view of the pump apparatus.

Figure 6 is a detail top plan view of the body portion of the device having the gauges and closure cap removed.

Figure 7 is a fragmentary sectional view taken through the same on the line 7—7 of Figure 6.

Figure 8 is a transverse section taken through the device on the line 8—8 of Figure 4 and looking upwardly thereof.

Figure 9 is a transverse section similar to Figure 7 but taken on the line 9—9 of Figure 6.

Figure 10 is a detail enlarged sectional view of the screen sprayer support, taken on the line 10—10 of Figure 11.

Figure 11 is a top plan view of the same, and

Figure 12 is a diagrammatic view of the electrical circuit for controlling and operating the pump apparatus.

Referring now to the drawings, and first to Figures 1 to 5, the apparatus has a base 25 elongated laterally relative to the apparatus and provided at its front side with one or more legs 26 and at its rear side provided with a pair of transversely aligned bearing brackets 27 supporting an

axle 28, on the opposite ends of which are mounted rollers or wheels 29. The bracket bearings 27 also serve as supports for a pair of handles 30 which rise from the rear side of the base 25 to a desired height and are curved rearwardly to form hand grips to facilitate the tilting backwardly of the base 25 to dispose the weight of the apparatus on the rollers 29 so that the apparatus may be shifted manually from place to place for use. As the base 25 extends forwardly from the rollers 29, the base normally seeks a horizontal position with the leg 26 on the ground or supporting surface, so that the leg acts as an anchor to hold the apparatus from shifting during use.

Mounted on the intermediate portion of the base is an upstanding casing 31 which may be of any suitable configuration and of any suitable height. In the present instance the casing 31 is shown as of cylindrical shape and is cut away or open at opposite sides for housing therein a motor 32 which may be of the electric type and which has a transverse shaft 33 extending through the opposite sides of the casing 31 and connected at its opposite ends to fluid pumps 34 and 35 of conventional construction disposed over the opposite ends of the base 25.

The pumps 34 and 35 are supported by diagonal braces 36 which preferably converge from the opposite ends of the frame of the motor 32 and which may be integral with the casing of the pumps 34 and 35 as shown particularly in Figures 1, 2 and 5. The motor 32 with its pumps 34 and 35 thus constitute a relatively rigid compact structure wherein the pumps are directly connected to and operated by the motor.

As shown particularly in Figure 4, the upper portion of the casing 31 comprises a closed and heat non-conducting compartment having a horizontal partition or bottom 37 which is bolted or otherwise suitably secured to the side walls of the casing 31 and which is disposed in spaced relation above the motor 32 to accommodate pipe connections and the like which will hereinafter be described. Within the compartment above the partition 37 is a container 38 which is disposed substantially concentric within the casing 31 and provides therewith an annular dead air chamber adapted to receive a heat non-conducting or insulating packing 39 extending throughout substantially the height of the container 38 so as to conserve heat within the container as will later appear. The lower end of the container 38 is seated and may be suitably sealed against the partition plate 37 so that the plate 37 serves as a bottom for the container as well as a support for the parts in the upper end of the casing 31 and as a support for the container itself.

The container 38 is in communication with the intake side of the pump 34 by means of a pipe 40 which is secured by a suitable coupling through the bottom plate 37 of the container so that the pump may withdraw liquid from the interior of the container 38 when desired.

A top header or plate 41 is suitably recessed and rabbeted to detachably fit within the upper end of the casing 31 and also fit into the upper end of the container 38 for holding the casing and the container in their relative concentric positions and for effectively closing or sealing the container 38. Of course suitable gaskets and the like are used where found necessary but for the purpose of the present illustration it is deemed to be not essential but confusing to the illustration. The header 41 is provided near one side, such as the front side of the apparatus

and toward one end thereof, such as toward the end carrying the pump 34, with a hollow raised projection 42 providing an inlet for the header. The outer end of the hollow projection 42 has a downwardly extending opening 43 for communication with an inlet pipe 44 which extends downwardly through the insulation 39 and between the casing 31 and the container 38, the pipe 44 passing downwardly through the plate 37 and having connection with the outlet side of the pump 34. The hollow projection 42 extends inwardly of the casing 31 and opens downwardly through the header 41 for receiving one end of a suspended heater tube 45 adapted to hang within the receptacle 38.

The heater tube 45 may be supported in any suitable manner but is shown in the present instance as being suspended from the header 41 so that the heater tube may be withdrawn from the container merely by the removal of the header 41. The heater tube 45 may be of any suitable construction but is substantially U-shaped so as to carry liquid passing through the hollow projection 42 downwardly into the receptacle 38 and return the liquid through the heater tube upwardly to the header 41 at a spaced point and into a second hollow projection 46. The projection 46 is substantially parallel to the projection 42, although any other arrangement may be resorted to, and is connected at its inner end to the return end of the heater tube 45 while the outer end of the projection 46 is threaded or otherwise suitably constructed for receiving a supply pipe or hose 47 to carry off the heated liquid after it has passed through the heater tube 45. It will be noted from Figure 6 that the projections 42 and 46 of the header have threaded openings at their upper walls and these openings may be used for communicating suitable gauges or indicators 48 shown in Figure 3 by means of which the temperature and pressure of the liquid passing through the projections 42 and 46 may be readily observed.

The outlet projection 46 of the header 41 is provided at one side with a relief valve casing 49 which communicates with the interior of the header 41 and has a valve 50 urged normally by a spring 51 to its seat for closing the relief valve. The spring 51 is proportioned as to resistance to hold the relief valve 50 closed during the normal feed of the heated liquid through the supply pipe or hose 47. The hose 47 has a manually operable valve 52 and a suitable distributing nozzle 53 beyond the valve 52. When the valve 52 is closed, the back pressure of the liquid opens the relief valve 50 so as to vent the relief valve into the casing 49. The casing 49 is preferably integral with the header 41 so as to reduce the number of parts of the apparatus and insure that the parts remain in their relative positions. The relief valve casing 49 opens downwardly through the header 41 into a pipe 54 which extends down adjacent the rear side of the container 38 to a point near the bottom thereof and is thence carried forwardly and opens into a hollow stand 55 which, as best shown in Figures 4 and 10, has a flanged base 56 resting on the partition plate 37 and detachably secured thereto by bolts 57 or the like. The hollow stand 55 is stepped at its upper end to support a bearing 58, of the ball, or other suitable type, and about which turns a rotary head 59 having, above the hollow stand 55, a number of lateral threaded openings into which are fitted the lower ends of sprayer pipes 60.

The sprayer pipes 60 may be of any desired number and are shown in the present instance as being three in number, as illustrated in Figure 8, and the upper ends of the pipes may be steadied by a ring or circular brace 61 so as to unite the pipes into a rotor structure. The pipes 60 are provided with jet openings 62 at their inner sides but angularly disposed with respect to the radius of the rotor so that liquid under pressure issuing through the nozzle openings 62 provides an impeller action and thus rotates the rotor and forms a rotating inwardly directed spray.

The header 41 has an enlarged cup 63 formed therethrough toward the opposite side of the apparatus and spaced from the heater tube 45. The cup 63 is in axial alignment with the stand 55 and the rotor end is closed by a cap 64 adapted to be secured against the upper end of the cup by a suitable clamp 65 of conventional construction. A screen head 66 is removably fitted in the cup 63 and has a depending neck 67 to which is attached a screen 68, the latter being suspended from the neck 67 co-axially within the rotor so that the jets of liquid from the pipes 60 play against the exterior of the screen 68 during the turning of the rotor thereabout to cleanse the screen 68.

The header 41 is provided with a third hollow projection 69 which opens through one side of the cup 63, and the screen head 66 has a corresponding opening 70 therein, as shown in Figure 4, to admit liquid from the hollow projection 69 to the interior of the screen.

The screen head 66 may have a deflecting fin 71 on its inner face extending spirally downward from a point above the opening 70 so as to direct incoming liquid downwardly into the screen 68.

The screen 68 may be of cylindrical form, and at its bottom is provided with a sump basket or cup 72 within which may accumulate foreign matter, sediment and the like which may be carried by the liquid into the screen and which may be driven from the walls of the screen by the jets of liquid from the pipes 60. The liquid passes outwardly through the walls of the screen 68 into the container 38 and is withdrawn from the latter through the pipe 40 as before stated.

The hollow projection 69 opens at its outer end downwardly into a pipe 73 which extends downwardly through the packing 39 between the casing 31 and the container 38 and projects downwardly through the horizontal partition 37 and leads to a three-way valve 74 at the exterior of the casing 31 and adjacent the pump 35. One branch of the valve 74 is connected by a pipe 75 with the outlet side of the pump 35 while the other branch of the valve 74 is connected to an outlet or discharge pipe 76 which may be merely overturned to form a spigot. The pump 35, as best shown in Figure 2 and 5, is connected by a pipe coupling 77 with a filter 78 of any conventional type and which in turn carries a suction or intake pipe or hose 79. The hose 79 is adapted for detachable engagement through a quick operable coupling 80 with a drain pan 81 and with a suction nozzle 82, the pan and the nozzle being used one at a time according to the conditions of use of the apparatus. The coupling 80 admits of the quick and easy interchange of the pan and nozzle.

The screen 68, pipes 73, 75 and 79, together with the pump 35 and the other interposed parts, constitute a return conduit line for the used oil and the flushing oil in the crankcase. The conduit line may return, by operation of the pump

35, the flushing oil to the container 38, and may be utilized for withdrawing and discharging, through the outlet pipe 76, the used oil from the crankcase.

The apparatus may be operated in any suitable manner and by electricity controlled through any suitable circuit means, but preferably by the circuit control means shown in Figure 12. The header 41 may be utilized as a support for the controlling switch 83 to dispose the same adjacent the upper ends of the handles 30 so that the operator may have quick and easy access for starting and stopping the apparatus. With reference now to Figure 12, the switch 83 is shown as of the two pole breaker type included in two wires 84 and 85 which lead to the motor 32. The wires 84 and 85 are divided at their source from one of a three cable feed circuit and through a magnetic switch 86. The wire 85 has an operating or resistance coil 87 therein for controlling the switch, the wire 85 constituting the conductor cable of the circuit. The conductor cable 85 has a branch wire 88 leading from a point adjacent the motor 32 and the branch wire 88 constitutes the center lead of the three wire feed line. The other wire 89 of the feed line leads into a heater unit 90 which may encircle one leg of the heater tube or pipe 45, and which is returned to the wire 88 as shown. A second heater unit wire 91 leads from the line wire 84 to the central or return wire 88. The heater unit wires 84 and 89 are each provided with a thermo-relay 92 for protecting the heater units 90 and 91 also cable and conductors 84, 85, 88, 89 from overload.

The magnetic switch 86 with the thermo-relays 92 may be mounted permanently upon a panel board and a four wire cable, containing the wires 85, 84, 88 and 89, may be carried by the apparatus and may have a four pole plug or other suitable connection for detachable engagement in a correspondingly constructed receptacle at the bottom of the magnetic switch to admit of the quick and easy coupling and uncoupling of the pump apparatus from the feed line.

In the use of this pumping apparatus, when it is desired to flush out a crank case or the like, the drain plug is removed or opened in the ordinary manner so that the used oil may drain from the crank case. The pan 81 is placed beneath the crank case to catch this oil and the switch 83 is operated to start the apparatus. The pan 81 is connected by means of the quick coupling 80 to the intake or suction hose 79 which leads through the strainer 78 to the pump 35. The three way valve 74 is adjusted so that the used oil withdrawn from the pan 81 may be driven off through the outlet pipe 76 into any suitable container for carrying away the used oil. At the same time the pump 34 is operated so as to circulate a light flushing oil, disposed in the container 38, from the bottom of the container through the pipe 40, pump 34 and pipe 44 to the header 41 where the oil is forced through the heater pipe or unit 45 and past the check valve 50 into the pipe 54 which carries the light oil to the spray tubes 60 so that the light oil is sprayed against the exterior surface of the screen 68 and is returned to the interior of the container 38.

The oil is thus circulated until it reaches the desired warm temperature. At this time the spray nozzle 53 is inserted in the filler opening of the crank case and the valve 52 opened. When the valve 52 is open, pressure on the check valve 50 is relieved and the warm light flushing oil is

sprayed into the crank case and is forced with desired pressure against the inner walls of the crank case so as to effectively dislodge sediment and the like adhering thereto. The pan 81 being
 5 empty, the three way valve 74 is adjusted so that the flushing oil, draining from the crank case into the pan 81, is carried through the screen 78, pump 35, pipe 75, valve 74 and pipe 73 into the
 10 top of the header 41 where the flushing oil is delivered into the top of the strainer or screen 68. The oil now passes outwardly through the walls of the screen back into the container 38 and the sediment and other foreign accumulations in the oil are collected in the pan or cup 72 at the
 15 bottom of the screen. The oil, after passing through the strainer 68, may be continued in the circuit for as long a period as is practicable and until the crank case is completely flushed. At this time the valve 52 may be closed and the spray
 20 nozzle 53 withdrawn from the crank case whereupon the check valve 50 is forced open by the accumulation of pressure in the circuit and the flushing oil is thus returned to the container 38. At the same time, the remainder of the oil in the
 25 drip pan 81 is also returned to the container 38 for further use. The flushing oil is maintained at a desired temperature sufficient to melt down sludge or lubricant remaining in the crank case and also to evaporate moisture.

When the apparatus is used for cleaning out a transmission, the same operation may take place with the exception that where there is no drain plug provided, the suction nozzle 82 may be substituted for the drip pan 81 on the suction pipe
 30 79 so that the used oil in the transmission case may be withdrawn by the pump 35 through the nozzle 82.

This latter operation also takes place in cleaning out differential gear cases where no bottom or drain plug is provided. If the oil in the differential casing will not flow or is too heavy to be
 40 withdrawn by suction through the nozzle 82, due to a low temperature or the like, the spray nozzle 53 may be inserted in the filler opening of the casing to direct hot oil into the casing so as to thin out the contents of the case and raise the temperature of the oil therein so as to cause the free
 45 flow of the used oil or other lubricant.

After completing a flushing operation, the used flushing oil may be removed from the apparatus through the discharge pipe 47 into a suitable slop oil receptacle, and the strainers of the apparatus
 50 should also be removed and cleaned. It will be noted that the electric circuits, shown in Figure 12, are so disposed that the current cannot be supplied to the heating units 90 and 91 unless the motor 32 and the pumps 34 and 35 are in operation to circulate the oil while the heating units are in
 55 operation. It is, of course, necessary to maintain a sufficient amount of flushing oil in the circuit to protect the apparatus when the motor is operated.

The device may be readily transported from place to place by merely tilting the base 25 to
 65 raise the front leg 26 and dispose the weight of the apparatus on the rollers 29. The device may also be quickly brought to a stop by merely relieving pressure on the upper ends of the handles 30 so that the weight of the apparatus will swing it into upright position for supporting the appa-
 70 ratus on the leg 26 and the rollers 29.

It will be obvious that various changes may be made in the construction, combination and arrangement of parts which could be used without
 75 departing from the spirit of my invention, and

I do not mean to limit the invention to such details except as particularly pointed out in the claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent of the
 80 United States is:—

1. In a pumping apparatus, a container for flushing oil, a heater for the oil, a pump circuit connected to the container and to said heater, a valved take-off pipe connected to said circuit
 85 for supplying heated flushing oil to a crank case and the like, a return conduit line connected to said container for returning thereto used lubricant and flushing oil from the crank case, and a valved outlet pipe connected to said return conduit line for withdrawing used lubricant there-
 90 from.

2. In a pumping apparatus, a container for flushing oil, a heater for the oil, a pump circuit including the container and the heater, a valved
 95 take-off pipe connected to the circuit for taking off the heated flushing oil for a crank case and the like, a return conduit line having return means for the flushing oil from the crank case and including a screen opening into the con-
 100 tainer, and a valved outlet pipe connected to the return conduit line for carrying off used lubricant from the crank case.

3. In a pump apparatus, a container for flushing oil, a pump circuit connected to the container
 105 for circulating oil therethrough, a heater connected in said pump circuit and disposed within the container for heating the flushing oil in circulation, a take-off pipe connected to said circuit for supplying heated flushing oil to a crank case and the like, a return conduit line, a screen connected to said conduit line and opening into
 110 the container, and a discharging device connected to the conduit line for removing used lubricant and flushing oil from the crank case before it returns to the container.

4. In a pump apparatus, a container for flushing oil, a portable support for the container, a double pump mechanism mounted on the support, a connection between one pump and the
 120 container for withdrawing flushing oil therefrom, a second connection from the pump to said container for returning the oil thereto, a heater in said second connection for heating the oil returned to the container, a valved take-off pipe connected to the heater for withdrawing heated
 125 flushing oil for crank cases and the like, a pipe connected to the intake of the second pump for withdrawing used lubricant and flushing oil from the crank case, a screened connection between the outlet of the second pump and the container
 130 for returning screened flushing oil to the container, and a valved outlet pipe connected to the outlet side of the second pump for withdrawing used lubricant from the crank case.

5. In a pump apparatus, a casing, a portable base for the casing, a container in the casing
 135 for flushing oil, a heater disposed in the container, a screen mounted in the container, pump means mounted on the base and connected to the container and the heater for circulating and heating the flushing oil, a valved take-off pipe connected to the heater for delivering heated
 140 flushing oil to a crank case and the like, a second pump means on the base having an outlet connected to said screen and having an inlet for receiving flushing oil from the crank and for receiving used lubricant from the crank case and means connected to said second pump means for
 145 withdrawing used lubricant therefrom.

6. In a pump apparatus, a casing, a portable base for the casing, a container in the upper part of the casing for flushing oil, a motor mounted in the lower portion of the casing, a pair of pumps connected to the motor and disposed at opposite sides of the casing on the base, circuit pipes disposed between the lower and upper ends of the container and one of said pumps for circulating oil through the container, said heater connected to the upper circulating pipe, a valved take-off pipe connected to the heater for supplying heated flushing oil to a crank case or the like, a screen mounted in the container, a pipe leading from the outlet of the second pump to said screen, a valved outlet pipe connected to the outlet of said second pump, and a pipe connected to the inlet of the second pump for withdrawing lubricant and flushing oil from the crank case.

7. In a pump apparatus, a portable base, a casing extending upwardly from the base, a container mounted in the upper part of the casing adapted to contain flushing oil, a motor mounted in the lower end of the casing, a pair of pumps mounted at the opposite sides of the casing and connected to the motor, circulation pipes disposed between one of said pumps and the container, a heater mounted in the container and connected to one of the circulation pipes and to the container, a valved take-off pipe connected to the heater for taking off heated flushing oil, and a return conduit line connected to the second pump and to the container for returning oil to the latter from the crank case.

8. In a pump apparatus, a portable base, a casing mounted on the base, a container in the casing for flushing oil, a pump unit mounted on the base at the bottom of the casing and having a pair of independent pumps, circuit means between one of said pumps and the container and including a heater disposed in the container, a valved outlet pipe connected to said circuit for withdrawing heated flushing oil therefrom, a return conduit line connected to the second pump and to the container, a screen in said conduit line, and means connected to the conduit line for receiving lubricant and flushing oil.

9. In a pump apparatus, a base having a supporting leg at its front side, supporting rollers at the rear side of the base, upstanding handles mounted on the rear side of the base for tilting the base and manipulating the same on the rollers, a casing carried by the base and extending upwardly therefrom, a container mounted in the upper part of the casing, heat insulating packing disposed between the casing and the container, a heater mounted in the container, a screen mounted in the container, a pump unit mounted in the lower end of the casing and having a pair of pumps, circulating pipes between one of the pumps and the container and heater, other circulating pipes between the second pump and the screen and container, a valve outlet pipe connected to the first circulating pipes and an

inlet pipe connected to the second circulating pipes.

10. In a pump apparatus, a portable base, a casing mounted on the base, a container mounted in insulated relation within the casing, a motor unit mounted in the casing having a pair of pumps, a heater mounted in the container and opening at one end thereinto, a screen mounted in the container and opening into the same, a set of circulating pipes disposed between one of said pumps and the container and other end of the heater, a second set of circulating pipes connected to the second pump and opening into said screen, a valved outlet pipe connected to the first set of pipes for withdrawing heated liquid therefrom, and an inlet pipe connected to the second set of pipes for admitting liquid through the second pump.

11. In a pump apparatus, a portable base, a casing mounted on the base, a container mounted in the upper part of the casing, a motor unit mounted in the lower part of the casing and having a pair of pumps, an outlet pipe leading from the bottom of the container to the inlet of one pump, a heater mounted in the container and opening at one end into the same, a pipe leading from the outlet of said pump to the other end of the heater, a valved take-off pipe leading from the heater to supply heated flushing oil from the container to a crank case or the like, a check valve arranged between the container and the heater for admitting heated oil to the container when said take-off pipe is closed, a screen mounted in the container, a pipe leading from the screen to the outlet of the second pump, and an inlet pipe connected to the inside of the second pump for receiving lubricant and oil from a crank case.

12. A pump apparatus comprising a base, a motor mounted on the base, a pair of pumps connected to the opposite ends of the motor shaft, a container supported on the base above the motor, circulating pipes between one pump and the container, a heater in said circulating pipes for heating the oil circulated through the container, a take-off pipe leading from the heater, a second set of pipes connected to the second pump with one pipe opening into the container and another pipe adapted to receive oil and lubricant, and electric circuit means connected to the motor and to said heater for operating the same.

13. In a pump apparatus, a container, a heater in the container, a motor, a pair of pumps connected to the motor, circuit means between the container and heater and including one of said pumps, outlet means connected to said circulating means for withdrawing heated oil from the container, a return conduit line connected to the second pump and to said container for supplying oil to the latter, and electric circuit means including the motor and the heater and having a single control switch for simultaneously closing a circuit through the motor and the heater.

SIDNEY LAURENCE MENGE.